Risk Factors of Type 2 Diabetes Mellitus in Middle and Elderly Urban Population of Cuttack City

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Abstract-

Background- Type 2 diabetes is one of the major public health problems in India. Diabetes can affect almost every organ in the body, causing blindness, kidney disease, amputation, and increased risk of stroke, heart disease, peripheral neuropathy.

Objectives: 1. To detect the spread of type 2 diabetes in Urban Population of Cuttack City 2. How obesity is associated with Diabetes Mellitus

Methods: A community-based study was conducted from March 2013 to Feb 2014 at the SCB Medical College gym, at the Jobra urban health center. A collection sample method was used using a total of 502 participants and a pre-developed proforma interviewed.

Results: The prevalence of Mellitus diabetes in the current study was 19.5%. Diabetes mellitus gradually increases over the years ($X2 = 12.24$, df = 3, p = 0.0066). Type Diabetes Mellitus most closely related to duration of exercise ($X2 = 4.37$, 1df, P = 0.03), family history of Diabetes ($X2 = 136.1$, 4df, p = 0.001), Weight Index ($X2 = 58.18$, 3df, p < 0.001).

Keywords- *Diabetes, Risk factors, prevalence, Duration of Exercise, Family history, BMI.*

Introduction-

Diabetes mellitus, long considered a major challenge of Public Health, now appears as one of the major threats to human health in the 21st century.[1] The last two decades have seen a dramatic increase in the number of people diagnosed with diabetes. all around the world. The World Health Organization (WHO) estimates that 135 million people were diabetic in 1995 and that number will increase to 300 million by 2025. [2]

India currently has the largest number of people with diabetes in the world with an estimated 19.4 million people. This is expected to be 57.2 million by 2025The city centers are the nation's diabetic capitals and every sixth person has type 2 diabetes which is 16.6% prevalence. [3] Type 2 Diabetes mellitus is the most common type of diabetes worldwide. This type of diabetes is considered to be a lifestyle disorder. Hidden genetic predisposition is revealed in the presence of natural factors such as sedentary lifestyles, changes in eating habits from junk food to high-calorie foods, high carbohydrate intake and the stress of urban life. [4]

This is causing great concern as the cost of treating diabetes begins to weigh heavily on health resources.[5] In Type 2 diabetes the risk of some of these complications (eg cardiovascular disease), may begin even before the onset of diabetes. People with diabetes have a 25 chance of blindness, 17 chances of kidney disease, 30-40 times major cuts, 2 - 4 chances of myocardial infarction and a double chance of developing diabetes [6,7,8.]

Diabetes mellitus reflects what happened in Iceberg, where an unknown illness surpassed a known illness. The

disease itself begins in a subtle way, with subtle symptoms of malaise, polydipsia, polyphagia and polyuria. Diagnosis is made during a routine medical examination or when a patient has complications.

A few factors have been involved in the etiology of diabetes mellitus. These include environmental considerations, nationality, genetics, socioeconomic status, social and cultural patterns, food status, gender and biodiversity. In most comprehensive studies not a single factor has been identified in the cause. Thus, preventing diabetes or the initial delay of diabetes even in a single patient demonstrates victory in the health care system and the national economy.

The objectives of our research were to:

1. Detecting the prevelance of type 2 diabetes in the suburbs of Cuttack City
2. Identify certain known risk factors associated with Type 2 Mellitus Diabetes

Methodology-

The present study was carried out in the urbanhealthcentreareaJobra,Cuttackforaperiodof one year from March 2013 to Feb 2014 (includinganalysisandconclusions).ACrosssectionalcommunitybasedstudywasconductedamongthe35years and above general population of field practicearea of SCB Medical College. The urban health training centreJobra, fallsunderMuncipalCorporationofCuttack,GovernmentofOdisha. The area of urban health training centre has dividedinto33underdevelopedslumsand8developedslumsandcoversatotalpopulationof18,902.

Inthisstudy"clustersampling"methodwasused.Thisurbanhealthcentrehasfulfilledcertaincharacteristicsofcluster samplingmethods.Insteadofvillagesorhamletsthiswasdividedintodevelopedas well as underdeveloped slums and the clustersshouldbemorethan30 each.Hence,thisareawasselected and clustersamplingmethodwasused.

In the cluster sampling method, initially we found thesampleinterval,whichcanbeobtainedbydividing the total number of clusters to the total population orcumulativepopulationoftheurbanhealthcenterareaand found the sample interval was 1784. Hence, thisvalue fallen in 1stslum area and to get the 2ndclusteraddthisvaluetothefirstclusterpopulation.Similarlyto get the 3rdcluster, sample interval plus 2ndclusternumber and so on.That's how clusters are made tilltherequirednumberofclusters(33).

SelectionoftheHouseholds

Ineachcluster,firstreachedthecentreoftheslumwherethe3or4roadsaremeetingoneachother.Thereselectedtheone ofthelanebylotterybasedaftergivingthe lanes number.Even in the lane also picked up arandomnumberfromcurrencynotetostartthehouseholdsurvey.Iftherandomnumberis3,thenthesurveystarted from the 3rdhouse onwards. In one house wegot3eligibleagegrouppersonsthentakenthehistoryofallthethreepersons.Iftherearenoeligibleagegrouppersonsi nthehouse,thenmovedtoanotherhousetillgettherequiredsampleineachcluster.

Sample size for this study can be drawn fromprevalence of diabetes mellitus on Cuttack urban population published previously. In this studyprevalencewasshowntobe16.7%,andallowableerrortaken as 20% and formulae[13] used here is 4PQ / L^2. Apilot study was conducted and tested and the actualstudy was started after making necessary correctionsand advises in it. A total of 502 patients or personswere screened for diabetes mellitus and preventivemeasureweresuggestedtothemduringtheoneyearperiod.

DiagnosticCriteria:AspertheAmericandiabetesassociation,whosefastingbloodsugarmorethan126mg / dl with symptoms can be considered as Diabeticindividual.NecessarystatisticaltestslikePercentages,chisquare test and Z tests were applied for statisticalanalysis.

Results-

The present study was conducted on 502 individuals selected in Urban community by cluster sampling method and examined over a period of one year. Of these, the prevalence (old and new cases) of Diabetes mellitus was 19.5% (98 / 502). About 11.3% (57) were found to be impaired glucose tolerance people and 69.1% (347) people have normal glycaemic status.

Table:1. Prevalence Of Diabetes Mellitus In The Study Population

Among Study Population	No of cases	Prevalence per 100 study population
Diabetic people	98	19.5%
IGT	57	11.35%
Normal people	347	69.15%
Total	502	100%
DM – Diabetes Mellitus, IGT- Impaired glucose tolerance		

Table2.DistributionofDiabetesMellitusinrelationtotheSocio-demographicCharacteristics:

Ageofthestudypopulation	DMpresent		DMabsent		Total		StatisticalTests
	No.	%	No.	%	No.	%	X2=12.24,df=3,p=0.0066
35-44	13	10.0	117	90.0	130	100	
45-54	46	21.2	171	78.8	217	100	
55-64	28	27.7	73	72.3	101	100	
e"65	11	2.03	43	79.7	54	100	
Total	98	19.5	404	80.5	502	100	
Sexwise							X2=0.71,1df,P=0.39
Male	48	18.2	217	81.8	265	100	
Female	50	21.1	187	78.9	237	100	
Total	98	19.5	404	80.5	502	100	

Table3:DistributionofDiabetesMellitusinrelationtocertainriskfactors:

FamilyHistory	DMpresent		DMabsent		Total		StatisticalTests
	No.	%	No.	%	No.	%	X2=12.24,df=3,p=0.0066
DiabetesMellitusfamilymembers	57	63.7	33	36.3	90		Relativerisk38.6,Oddsratio15.6X2=136.1,4df,p=0.001
Otherdiseasesfamilymembers	41	9.9	371	90.1	412	100	
Total	98	19.5	404	80.5	502	100	
BodyMassIndex							
<18.5	01	14.3	06	85.7	07	100	X2=58.18 3df,p<0.001
18.5-24.99	34	10.1	298	89.9	332	100	
25-29.99	57	37.5	95	62.5	152	100	
30>	06	54.5	.5	45.5	11	100	

Total	98	19.5	404	80.5	502	100	
Durationofexercise						
<30min/day	18	38.2	29	61.8	47	100	Relativerisk38.2, Oddsratio2.48;X2=4.37,1df,P=0.03
>30min/day	12	20	48	80	60	100	
Total	30	28	77	72	107	100	

Discussion-

ThepresentstudywasconductedattheurbanhealthcentreJobra, urban community of CuttackduringtheperiodofoneyearfromMarch2013toFeb2014.Atotalof502-studypopulationwereexaminedofwhom98(19.5%)werefoundtobediabetesmellitusand 57 (11.3%) were found to be impaired glucosetolerancegroup.Theprevalenceofthediabetesmellitusin the present study was 19.5% and similar findingwasobservedwithRamachandranA,SnehalathaCetal [3] found the prevalence was 16.6% in Hyderabad.Similarly,accordingtoBaiPV,KrishnaSwamyCVetaltheprevalencewasfoundtobe17.4%inChennaiUrbanPopulation.ThisstudyhasconcordancewiththeKuttyVR et al [16] who observed a prevalence of 16.9% inTiravananthapuramUrbanPopulation.WeskSKMunozBetalfoundtobe21.4%intheagegroupof40yearsandabove.

The prevalence of type 2 diabetes mellitus in thisstudywashigheramongfemalesat21.1%,thanmalesat16.2%.However,thisdifferencewasnotstatisticallysignificant (P > 0.05). Several other researchers havehad similar findings. Asha Bai PV, Murthy BN et al [23]foundtheprevalencewas10.5%infemalesaged>or= 40yrs and 9.2% in males and in the prevalence ofDiabetesmellitusandfemaleswasstasticallysignificant(P < 0.05). Misra A, Pandey RM et al [24]conductedastudyinDelhiandtheyopinethatdiabetes mellitus was recorded in 11.2% of males and 9.9% offemales. Some of the other studies show no genderdifference.RamachandramAetalconcludedthatprevalence of diabetes mellitus does not have anygenderdifference.

In the present study, among exercise practicingpeople30.6%prevalenceofdiabeteswasobservedand69.4% prevalence observed in exercise not practicingpeople.Theassociationbetweenthepracticeofexerciseanddiabetesmellituswasstatisticallysignificant(p<0.05).Severalotherresearchesfoundthesameresults.NaeemAGconductedstudyinKashmirmenandstatedthatexerciseinverselyrelatedwithdiabetesmellitus.RamachandranA,SnehalathaCetal[17]stated thatdiabetesmellitusindirectlyrelatedwiththeduration exercise. According to Ferry J [14]stated thatpersons who were undergone physical acitivity lessthanhalfanhourperdaywereinverselyrelatedwithdiabetesmellitus.

Among diabetics, 58.2% were giving family history of diabetes and significantly associated with the type 2 diabetes mellitus in the present study. Several researchers found the same finding i.e. 53.1% were giving family history of diabetes. This finding was correlated with De Silva SN, Weerasuriya N et al [19] (2002) conducted a study in Srilanka, Oneyemere KV, Lipton RB et al [25] conducted a study in Chicago and concluded that a positive parenteral history of DM appears to be more strongly economic related to childhood type 2 than type 1 Diabetes Mellitus. A similar finding was observed with the Ramachandran A, Snehalatha C et al [20] found that families with a positive family history of diabetes significantly associated with the type 2 diabetes mellitus.

Body mass index (BMI) is very important tool in the measurement of obesity. In the present study, 54.5% of diabetics were in 30 plus range, 37.7% of diabetics were in 25-29.99 ranges, 10.1% of diabetics were in 18.5-24.99 range and 14.2% of diabetics were in <18.5 range. Prevalence of type 2 diabetes mellitus associated with the high BMI (>25kg / m2) and statistically significant (x2-58.18, p<0.001). This study correlated with the Vikram NK, Misra AD et al [18] conducted a study in New Delhi and defined that cut offs for defining obesity by

BMI are lower than the suggested limit of 25 kg / m2. Most of the studies revealed that BMI associated with type 2 diabetes.

Based on the above results, simple life style modifications like practicing exercise and correction of obesity would decrease the burden of type 2 Diabetes Mellitus some extent in the future among the general population especially in the age group of 35 years and above group both in males and females.

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